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December 20, 2002

LCV-1640

Docket Nos. 50-425

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555

Ladies and Gentlemen:

**VOGTLE ELECTRIC GENERATING PLANT  
LICENSEE EVENT REPORT 2-2002-001  
UNSTAKED CAPSCREWS RENDERS RESIDUAL  
HEAT REMOVAL PUMP INOPERABLE**

In accordance with the requirements of 10 CFR 50.73, Southern Nuclear Operating Company hereby submits a Vogtle Electric Generating Plant licensee event report for a condition that was discovered on October 22, 2002.

Please contact this office if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Jeffrey T. Gasser". The signature is fluid and cursive, with a long horizontal stroke at the end.

Jeffrey T. Gasser

JTG/NJS

Enclosure: LER 2-2002-001

xc: Southern Nuclear Operating Company  
Mr. G. R. Frederick  
Mr. M. Sheibani  
SNC Document Management

U. S. Nuclear Regulatory Commission  
Mr. L. A. Reyes, Regional Administrator  
Mr. F. Rinaldi, Project Manager, NRR  
Mr. J. Zeiler, Senior Resident Inspector, Vogtle

JE22

**LICENSEE EVENT REPORT (LER)**

(See reverse for required number of digits/characters for each block)

Estimated burden per response to comply with this mandatory information collection request: 50 hrs. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to,

1. FACILITY NAME <b>Vogtle Electric Generating Plant - Unit 2</b>	2. DOCKET NUMBER <b>05000-425</b>	3. PAGE <b>1 OF 4</b>
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4. TITLE  
**UNSTAKED CAPSCREWS RENDERS RESIDUAL HEAT REMOVAL PUMP INOPERABLE**

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER(S)
10	22	2002	2002	001	00					05000
									FACILITY NAME	DOCKET NUMBER(S)
										05000

9. OPERATING MODE	0	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR § : (Check all that apply)								
		20.2201(b)	20.2203(a)(3)(iii)	50.73(a)(2)(ii)(B)	50.73(a)(2)(ix)(A)					
10. POWER LEVEL	0	20.2201(d)	20.2203(a)(4)	50.73(a)(2)(iii)	50.73(a)(2)(x)					
		20.2203(a)(1)	50.36(c)(1)(i)(A)	50.73(a)(2)(iv)(A)	73.71(a)(4)					
		20.2203(a)(2)(i)	50.36(c)(1)(ii)(A)	50.73(a)(2)(v)(A)	73.71(a)(5)					
		20.2203(a)(2)(ii)	50.36(c)(2)	X 50.73(a)(2)(v)(B)	X OTHER					
		20.2203(a)(2)(iii)	50.46(a)(3)(iii)	50.73(a)(2)(v)(C)	Specify in Abstract below or in NRC Form 366A					
		20.2203(a)(2)(iv)	50.73(a)(2)(i)(A)	50.73(a)(2)(v)(D)						
		20.2203(a)(2)(v)	X 50.73(a)(2)(ii)(B)	50.73(a)(2)(vii)						
		20.2203(a)(2)(vi)	50.73(a)(2)(i)(C)	50.73(a)(2)(viii)(A)						
		20.2203(a)(3)(i)	50.73(a)(2)(iii)(A)	50.73(a)(2)(viii)(B)						

12. LICENSEE CONTACT FOR THIS LER

NAME <b>Mehdi Sheibani, Nuclear Safety and Compliance</b>	TELEPHONE NUMBER (Include Area Code) <b>(706) 826-3209</b>
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13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO EPIX
B	BP	P	I075	Yes					

14. SUPPLEMENTAL REPORT EXPECTED				15. EXPECTED SUBMISSION DATE		
YES (If yes, complete EXPECTED SUBMISSION DATE)	X	NO		MONTH	DAY	YEAR

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On October 22, 2002, while defueled, residual heat removal (RHR) pump A was started for dynamic fill and vent of the RHR system. Moments later, the pump tripped. An investigation determined that a back casing ring capscrew had come loose and lodged between the impeller and the back casing ring. It was found that the pump was last operated on October 11, 2002, when the unit was in Mode 6 (Refueling). It is believed that the capscrew came loose and lodged between the impeller and the back casing ring as the pump was being placed into standby status on October 11<sup>th</sup>. Because two pumps are required to be operable at certain times in Mode 6, this represented operation in a condition prohibited by the Technical Specifications. Because the other RHR pump was also found to have inadequately staked capscrews, this represented a condition that could have prevented the fulfillment of the safety function of a system needed to remove residual heat. This condition is also reportable per 10 CFR 21.21 because similar back casing rings with inadequately staked capscrews were found in the warehouse.

The root cause of this event was determined to be the failure of the manufacturer to properly stake the back casing ring capscrews. The capscrews on the back casing rings for both Unit 2 RHR pumps were properly staked prior to the pumps being returned to service and the Unit returning to Mode 6.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

**A. REQUIREMENT FOR REPORT**

This event is reportable per 10 CFR 50.73 (a)(2)(i)(B) because the unit was operated in a condition prohibited by the Technical Specifications (TS) for a period of 6 hours and 31 minutes. It is also reportable per 10 CFR 50.73 (a)(2)(v)(B) because a condition existed that could have prevented the fulfillment of the safety function of a system needed to remove residual heat. Furthermore, this report is being made per the requirements of 10 CFR 21.21 because defective components were procured whose use could have led to the creation of a substantial safety hazard.

**B. UNIT STATUS AT TIME OF EVENT**

At the time of the discovery of this event, Unit 2 was defueled at 0 percent of rated thermal power. Personnel were preparing for fill and vent of the residual heat removal (RHR) system. Other than that described herein, there was no inoperable equipment that contributed to the occurrence of this event.

**C. DESCRIPTION OF EVENT**

On October 22, 2002, while defueled, residual heat removal (RHR) pump A was started for dynamic fill and vent of the RHR system. Moments later, the pump tripped.

Personnel found that the pump shaft could not be hand turned. An investigation determined that a back casing ring capscrew had come loose and lodged between the impeller and the back casing ring.

It was found that the pump was last operated on October 11, 2002, when the unit was in Mode 6 (Refueling). It is believed that the capscrew came loose and lodged between the impeller and the back casing ring as the pump was being placed into standby status on October 11<sup>th</sup>.

**D. CAUSE OF EVENT**

The root cause of this event was determined to be the failure of the manufacturer to properly stake the back casing ring capscrews. Each capscrew is torqued and staking performed as a redundant measure to hold the capscrews in place. Although staking had been performed for the back casing rings inspected, it was inadequate to prevent at least one of the capscrews from backing out of the casing ring after it had lost its torque and become loose.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

RHR pump B was inspected and found to have a similar condition. Spare back casing rings in the warehouse were also inspected and found to have a similar condition of inadequately staked capscrews.

**E. ANALYSIS OF EVENT**

From the period of time when RHR pump A was stopped on October 11, 2002, at 1017 EST, until the reactor cavity water level was raised to 23 feet above the vessel flange at 1648 EST, Unit 2 operated in a condition prohibited by TS 3.9.6 because two RHR pumps were not maintained operable. However, the system safety function continued to be met because RHR pump B remained operable.

The spare back casing rings in the warehouse were not placed into service with the inadequately staked capscrews and did not create a substantial safety hazard.

In addition, the improperly staked capscrews on both RHR pumps represent a condition that could have prevented fulfillment of a safety function of a system needed to remove residual heat. Discussions with pump vendor personnel determined that there are approximately 60 of these pumps in service in the nuclear industry, most with several years of service, and that this was the first failure of this type. Additionally, 15 of these pumps, including the 4 in Units 1 & 2, have undergone a coupling modification in recent years that replaced the back casing ring. However, it is not known if the back casing ring defect is limited to only those casing rings that were procured for the modifications or if the original pump back casing rings also possess this defect. Nonetheless, this was the first failure of this type for any of the 60 pumps, providing assurance that this event was an isolated occurrence and that RHR pump B was unlikely to also fail due to this mechanism.

It is not known if the Unit 1 RHR pumps have a similar condition of improperly staked capscrews. However, the following facts are known:

- As described above, the unlikelihood of this occurrence is reflected in the hundreds of pump service years by this type of pump in the nuclear industry, with no similar events.
- Per discussion with the vendor, a loose capscrew is more likely to be discharged from an operating pump rather than be caught in the impeller, as occurred here.
- Plans are underway to develop a methodology to ensure the Unit 1 RHR pumps remain operable following each run to ensure that no capscrews have jammed the impellers.

These facts provide assurance that the Unit 1 pumps will continue to function until they are inspected during the Fall 2003 refueling outage.

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TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

Based on these considerations, there was no adverse effect on plant safety or on the health and safety of the public as a result of this event.

This event represents a safety system functional failure.

**F. CORRECTIVE ACTIONS**

- 1) The capscrews on the back casing rings for both Unit 2 RHR pumps were properly staked prior to the pumps being returned to service and the Unit returning to Mode 6.
- 2) The supplier of the spare back casing rings in the warehouse was advised of the defect. The casing rings themselves were returned to the vendor for reworking.
- 3) A methodology will be developed by January 20, 2003, to ensure the Unit 1 RHR pumps remain operable after each pump run to ensure the impellers have not become jammed.
- 4) Each pump's back casing rings will be inspected during the Fall 2003 refueling outage and appropriate actions will be taken as necessary.

**G. ADDITIONAL INFORMATION**

- 1) Failed Components:  
RHR pump manufactured by Ingersoll-Rand, Model number 8X20WDF.  
Back casing ring part number: 6B.  
Capscrew: 118C.
- 2) Previous Similar Events:  
There have been no previous similar events in the last two years.
- 3) Energy Industry Identification System Code:  
Residual Heat Removal System - BP  
Reactor Coolant System - AB